

Patent claims

Sub D3

1. Tampon, especially for feminine hygiene, formed from an approximately cylindrical blank which is shaped by winding up a portion of length of tape-shaped nonwoven material, and the circumferential surface of which is pressed radially relative to the longitudinal mid-axis of the blank over an even number of at least 6 portions mutually adjacent in the circumferential direction of the winding blank, characterized in that only narrow strip-shaped portions of the circumferential surface of the winding blank, which are arranged at equal angular distances from one another, are pressed to produce a preform which, as seen in cross-section, consists of a central approximately circular fibre core (16) of high compression and buckling strength and of longitudinal ribs (17) of softer fibre structure and with a coarser capillary structure which extend radially outwards from the fibre core and which are separated from one another by outwardly open longitudinal grooves (18), and in that, accordingly, only the soft longitudinal ribs of the preform (15) have been exposed to a low uniform pressure, radial relative to the longitudinal mid-axis of the preform, in such a way that the outer ends of the longitudinal ribs form a soft essentially smoothly cylindrical surface of smaller diameter, with the coarser capillary structure corresponding to the final form of the tampon being maintained (10).

2. Tampon according to Claim 1, the blank of which is produced from a needled nonwoven tape consisting of 100 % rayon fibre, characterized in that the tampon, with a weight of 2.4 g without the recovery tape, has a specific absorption capacity of 4.8 ml/g at an absorption rate of 1.9 ml/s.

3. Tampon according to Claim 2, characterized in that the absorption capacity of the tampon amounts to 11.3 ml at a static counterpressure of 20 mbars.

4. Tampon according to Claims 1 to 3, characterized in that, at a pulsating counterpressure of 20 to

110 mbars, the absorption capacity of the tampon amounts to 8.0 ml and the specific absorption capacity to 3.4 ml/g.

5. Tampon according to one of Claims 1 to 4, characterized in that the diameter of the tampon, in its final form, amounts to between 13 and 15 mm, the central fibre core having a diameter of 4 to 8 mm.

6. Process for producing the tampon according to Claims 1 to 5, in which an essentially cylindrical blank is shaped by winding up a portion of length of tape-shaped nonwoven material, the circumferential surface of which is pressed radially relative to the longitudinal mid-axis of the blank over an even number of at least six portions mutually adjacent in the circumferential direction of the winding blank, characterized in that only narrow strip-shaped portions of the circumferential surface of the winding blank, which are arranged at equal angular distances from one another, are pressed to produce a preform which, as seen in cross-section, consists of a central approximately circular fibre core of high compression and buckling strength and of longitudinal ribs of a softer fibre structure with a coarser capillary structure which extend radially outwards from the fibre core and which are separated from one another by outwardly open longitudinal grooves, and in that, accordingly, only the soft longitudinal ribs of the preform are exposed to a low uniform pressure, radial relative to the longitudinal mid-axis of the preform, until the outer ends of the longitudinal ribs have formed a soft essentially smoothly cylindrical surface of smaller diameter, with the coarser capillary structure corresponding to the final form of the tampon being maintained.

Sub E<sup>8</sup> 7. Process according to Claim 6, characterized in that the winding blank is centred before the pressing.

Sub E<sup>9</sup> 8. Process according to Claim 6, characterized in that the preform is moved for shaping purposes.

Sub D<sup>4</sup> 9. Apparatus for producing the tampon according to one of Claims 1 to 8 and for carrying out the process

according to one of Claims 6 to 8,) consisting of two groups of altogether at least six press dies arranged in a plane perpendicular to the press axis, the first group of press dies forming press segments, of which the side flanks, in the closing position of the press segments, form respectively for each of the press dies of the second group guide surfaces which are designed as sliding plates, in the closed state the end faces of the press dies forming an essentially cylindrical pressing face, characterized in that the press segments (22) and the sliding plates (24) form a preforming press for the pressing of a preform (15), press cutters (27) projecting from the end faces (25, 26) of the press segments (22) and of the sliding plates (24), and in that the preforming press is followed by a stationary conical forming die (29) which is arranged coaxially relative to the press axis, and the entry orifice (30) of which is calculated to match the diameter of the orifice of the preforming press, when its press dies (22, 24) are in the closed state, and the exit orifice (32) of which is calculated to match the final cross-section of the finished tampon (10).

Sub 3 / Sub 11 10. Apparatus according to Claim 9, characterized in that the press cutters (27) project from the end faces (25, 26) of the press segments (22) and sliding plates (24) at equal angular distances ( $\alpha$ ) and over the same length.

Sub 11 / Sub 11 11. Apparatus according to Claims 9 or 10, characterized in that all the press cutters (27) have the same pressing faces (28).

Sub 11 / Sub 11 12. Apparatus according to Claim 11, characterized in that the pressing face (28) of the press cutters (27) which is parallel to the press axis (21) is curved outwards.

Sub 11 / Sub 11 13. Apparatus according to Claims 9 or 10, characterized in that the press cutters (27) have pressing faces (28) of differing form.

14. Apparatus according to one of Claims 9 to 13, characterized in that the length and width of the press

cutters (27), radial relative to the press axis (21),  
amounts to 10 and 2 mm respectively.

15. Apparatus according to one of Claims 9 to 14,  
characterized in that, when the press is in the closed  
state, the pressing faces (28) of the press cutters  
(26) assume a clear distance of 2 to 4 mm from the  
press axis (21).

16. Apparatus according to Claim 9, characterized  
in that the conical forming die (29) has an entry  
orifice (30) with a diameter of 20 mm and an exit  
orifice (32) with a diameter of 13 mm.

17. Apparatus according to one of Claims 9 to 16,  
characterized in that all the press dies (22, 24) are  
first closable concentrically relative to the press  
axis (21) to approximately the diameter of the winding  
blank (11), subsequently the press segments (22) of  
the first group are simultaneously movable  
concentrically into the closing position, and  
thereafter the sliding plates (24) of the second group  
are movable to the final dimension of the preform  
(15).

18. Apparatus according to one of Claims 9 to 16,  
characterized in that the press segments (22) and the  
sliding plates (24) are simultaneously movable  
concentrically relative to the press axis (21) into  
the closing position which corresponds to the final  
dimension of the preform (15).

19. Apparatus according to one of Claims 9 to 18,  
characterized in that, arranged on the input side of  
the preforming press, there is a ram (33) which is  
movable axially to and fro for ejecting the preform  
(15) from the preforming press and for pushing the  
preform through the conical forming die (29).

add D8

add E18

add H12

add K3

add F12

add I11